

One of the worst features of the coroner system is the coroner's jury, as such juries are usually constituted. The Michigan act does not require a jury, but makes the calling of a jury optional with the county medical examiner. The latter may issue summons; failure of attendance is subject to penalty. If it appears that death was due to the unlawful act of another, the county medical examiner shall submit his conclusions and those of the jury, if one was called, to the prosecuting attorney. Any and all medical examiners may be required to testify in behalf of the state.

In a measure so enlightened as this, it is a matter of regret to note one seriously undesirable feature. The bill provides that the state medical examiner is to be appointed by the governor for a term of four years. This carries with it the potentiality of making the medical examiner system a part of a state political machine. The terms of governor and state medical examiner should not coincide. If appointment is made by the governor, the term of the state medical examiner should be seven years, as in Massachusetts. It is to be hoped that this feature will be amended and that the measure will become a law. To Michigan would then belong the credit of being the first state to devise a state-wide agency for the scientific investigation of deaths of which government must take official cognizance.—*Journal of the American Medical Association*.

RABIES: AN ALL-YEAR HAZARD*

"Dog days," according to a dictionary definition, is a term used to describe "the sultry, close part of summer when dogs are supposed to be specially liable to go mad." It will be news, therefore, to the average person that actually fewer animals go mad in summer than during any other season of the year. This conclusion is indisputable. It is based on reports of the prevalence of rabies in animals for six years, as supplied to the United States Public Health Service by approximately one-half of the states.

Spring, for which period the six-year daily average of cases of rabid animals was 12.2, is the season when the disease is most prevalent. There is very little difference, however, between the incidence of rabies in the spring and during the cold months of winter, when the daily average is 11.7. During the summer, which includes the "dog days," the average falls to 8.2. In other words, only two animals become rabid in summer to every three in the spring, and only seven during the hot summer months to every ten during the winter.

The chief lesson to be learned from these figures, however, is the necessity for systematic, 100 per cent muzzling of dogs at all seasons of the year. Many instances are on record of more or less determined opposition to the enforcement of dog-muzzling laws and ordinances during the cold months. Such resistance doubtless has its foundation in the impression that rabies is a warm-weather disease in both animals and human beings. The facts, as just stated, show beyond contradiction that this impression is a mistaken one, so far as the seasonal incidence of this dread disease in animals is concerned.

With respect to human rabies, the situation differs only slightly from that described for animals. While it is true that a few more human cases are reported for July and August than at other seasons, the margin of difference is slight. In fact, the Public Health Service records show that for every five cases of human rabies in both July and August there are four cases in January, May, and October. The slightly larger number of these "dog days" cases in human beings is probably due, in part, to the fact that the length of the incubation period in man, while variable, averages from six weeks to two months. It is thus to be expected that the heaviest incidence of animal rabies, which occurs in the spring, will be followed by the maximum prevalence of human rabies in the summer months. Another point to be reckoned with is that the late spring and summer are the periods of greatest out-of-doors exposure to dog bites. This applies especially to children, with whom incubation is usually of shorter duration than in adults, and who, accordingly, are more apt to develop rabies soon after being bitten.

Since rabies is an all-year-round disease, both as to source of infection from animals and occurrence in man, the importance of rigid enforcement of dog-muzzling laws

and of gathering in stray dogs at all seasons is apparent. When the disease is once established in a human being it is hopelessly incurable. No method of treatment has yet been discovered which, at that stage, is of the slightest avail. The only protection against rabies lies in its prevention by means of the Pasteur prophylactic treatment. This should be administered as soon as possible after a dog bite, whether the animal be merely suspected of being mad or is known to be so. Fortunately, the treatment gives a practically 100 per cent protection. Conclusive evidence of its efficacy is afforded by the fact that in 6,156 cases treated at the Pasteur Institute in Paris in the ten-year period 1924 to 1933 only a single death occurred.—*Statistical Bulletin, Metropolitan Life Insurance Company, May, 1937*.

THE PLAGUE SITUATION*

It is now just forty years since the present pandemic of plague began with the appearance of an epidemic in Hong Kong, and it is just thirty-four years since it reached California. Arriving in India from Hong Kong, it found favorable conditions and soon after 1900 the deaths reached a million per year. Even now, after nearly forty years of continuous activity, the deaths from plague in India are occurring at the rate of three to four thousand per week. Considered in the light of the known history of plague, there is nothing unusual in these facts, nor is there in the length of time it has been continuously present in California any ground for believing that it is dying out and will shortly disappear. It is characteristic of plague that its period is very slow, and the rise and fall of epidemics is measured in decades and centuries. Upon its appearance in a country it is sometimes years before its presence is manifested by any great mortality, and in the subsidence of a pandemic its final disappearance is interrupted by sporadic localized outbreaks. The long range periodicity of plague, as well as its persistence, is well shown in the history of plague in England, where it finally disappeared in 1680 after its almost continuous presence for 136 years. The Great Plague of London occurred in 1665 with about 70,000 deaths, but there had been, previous to that time and within the 136-year period, five epidemics of from 10,000 to 35,000 deaths at intervals of thirty, ten, twenty-two, eleven, and thirty years.

The following, quoted from Procopius of Caesarea in his History of the Persian Wars, describing the pandemic of the sixth century, which is the first authentic historical pandemic, is interesting in its parallelism with more modern appearances. "It arose in Egypt with the inhabitants of Pelusium, then dividing spread one way through Alexandria and the rest of Egypt, the other into Palestine which borders on Egypt, and then traveled over the world, always advancing with a progress marked by certain definite spaces of time. For it seemed to advance by a certain law and to demand a certain space of time in every country, discharging its venom against no one on the way casually, but spreading on this side and on that to the uttermost ends of the world as if it feared lest incautiously it should pass by any corner or recess upon earth. It spared neither island nor cave nor mountain top where man dwelt. If it passed over any place only slightly or mildly touching the inhabitants, it returned there afterward, leaving untouched the neighbors against whom it had spent its rage before, and it did not depart from there before it made up the full measure of the dead in proportion to the amount of destruction which it had brought on its neighbors. Always beginning at the sea coast, it spread into the interior. In the second year it reached Byzantium about the middle of the spring where, as it happened, I was staying."

The great epidemics of ancient times seem to have been of the bubonic form, although it must be remembered that historical accounts of plagues include all epidemic disease, typhus, smallpox, etc., as well as plague, and it is only the description of buboes by some of the writers that identify bubonic plague. Pneumonic plague might have occurred, but for authentic accounts of pneumonic plague epidemics we have only comparatively small outbreaks in recent years in Manchuria, in limited districts of India, and on a still smaller scale in California. There are, however, references seeming to indicate that pneumonic plague accompanied

* A rabies quarantine is now being enforced in the city of Los Angeles.

* By W. H. Kellogg, M. D., Chief, Division of Laboratories, California State Board of Health.

some of the bubonic outbreaks and, therefore, doubtless occurred alone.

Guy de Chauliac, in his description of the plague at Avignon, which was part of the second historical pandemic in the fourteenth century says: "The plague commenced with us in January; it continued seven months during which time it appeared in two forms. During the first two months it was accompanied with a continuous fever and with a coughing of blood. All who were attacked died in three days. During the other months the continuous fever was accompanied with tumors and boils, which appeared in the external parts of the body, chiefly in the arm pits and in the groin. Those who were thus attacked died in five days."

With illness of the individual, the prognosis is of great interest and importance to him. So also with the commonwealth, when plague is endemic a prognosis is of interest. Reviewing the past history of the disease, an attempt may be made to predict what the future has in store for California and for the rest of the nation. It soon develops, however, that about the only thing that is certain about plague is the uncertainty of its disappearance and that usually about a century is required for it to finally flicker out. This is the history of human epidemics. But how about the endemic foci, where plague lies dormant during the intervals between epidemic or pandemic spread? The natural reservoir of plague is in wild rodents of squirrel or ground-hog type, and the historical foci are districts in Arabia along the Red Sea, in Mesopotamia, in Tibet, in Yunnan in China, and in Uganda in Africa. More recently endemic foci have been established in Manchuria, from which point the pneumonic epidemics of 1910 and 1916 originated, and in California where the native rodent concerned is the ground squirrel, *Citellus beechii*. The rat, as a carrier of plague, seems to be subject to the rise and fall of epidemics the same as his human associate. When plague disappears from a human population, it leaves the rat population also, but the enzootic does not exactly coincide with the epidemic. It usually precedes it and is likely to linger longer. The source of human bubonic outbreaks is the rat, and the source of rat plague is, doubtless, contact with wild rodents in some endemic focus. The primary source of plague, therefore, is the wild native rodent and the distributor is the rat who travels in ships and visits all lands. The rat occasionally returns the infection to wild rodents in some new locality, thus establishing a new endemic focus. This happened in California shortly after the introduction of plague into San Francisco about 1900,* and presumably the point of contact was in the vicinity of the Port Costa warehouses. At any rate, squirrel plague was first found in that vicinity, and the enzootic soon reached large proportions.

The record of plague in California is briefly as follows:

March, 1900. Bubonic plague appeared in San Francisco, principally in the Chinese colony, and a total of 121 cases, with 113 deaths, occurred over a period of four years.

May, 1907. Bubonic plague again appeared in San Francisco. The total number of cases in this outbreak over a period of six months was 160 and the deaths 78. This time not confined to Chinatown, but scattered over the whole city.

August, 1908. Plague proved to be present among the ground squirrels of Contra Costa County.

May, 1907, to December, 1918. Sporadic cases of human plague to the number of 11 with five deaths occurred in the counties of Alameda, Contra Costa, San Benito, Santa Clara, San Joaquin, and Stanislaus. Squirrel plague found to be present in the same counties as well as in Fresno, Monterey, San Luis Obispo, Santa Cruz, San Mateo, Merced, and San Francisco.

August, 1919. An outbreak of pneumonic plague in Oakland, which consisted of 13 cases with 12 deaths.

1919 to 1924, inclusive. Six sporadic cases with two deaths occurred in Alameda, Monterey, San Benito, and Santa Cruz counties.

October, 1924. An outbreak of pneumonic plague in Los Angeles, with 32 cases and 30 deaths.

November, 1924. Five cases of bubonic plague with three deaths in Los Angeles County.

1925 to 1933. Seven sporadic cases with five deaths in

the counties of Los Angeles, Santa Cruz, Monterey, and Santa Barbara.

1934.† One human case in Tulare County. Also a large epizootic among ground squirrels of Tulare and Kern counties, over two hundred positive specimens being found among those sent to the laboratory. Furthermore, an epizootic was discovered among the ground squirrels of Modoc County in the northeastern corner of the State on the eastern side of the Sierra.

This chronology of plague in California shows that we have had two bubonic epidemics, the first in San Francisco from 1900 to 1904, and the second in San Francisco and Oakland in 1907 and 1908. We have had two pneumonic epidemics, the first in Oakland in 1919, and the second in Los Angeles in 1924. We have had in all thirty-five sporadic cases with nineteen deaths, mostly in rural districts and of squirrel origin, nine counties being represented. Squirrel plague has been found in seventeen counties.

The plague situation on the west coast is of interest to health authorities throughout the country, as will be appreciated by a consideration of what the possible answer is to certain questions which immediately present themselves. These questions are: First, what is the probability of plague dying out before long? Second, what is the significance of ground-squirrel infection? Third, is plague in California a menace to other states? The answer to the first question is written in the history of plague, and from the brief references to that history already quoted in this paper it may be suspected that the chapter is not finished and may not be for many years to come. This is made all the more certain when it is remembered that there is every reason for believing that the historical epidemics and endemics were rat-borne and in course of time they did come to an end, whereas plague has been kept alive continuously in particular habitats where the rodent concerned was not the rat but a wild native animal such as the marmot. In these localities plague has not, so far as any one knows, ever completely disappeared. Such a focus now exists in the California ground squirrel.

In the answer to the second question we find the most disquieting aspect of the whole problem. In rat plague, pneumonia is not a common finding. Guinea pigs inoculated from rats rarely show lung involvement. In squirrel plague, pneumonia is common. Guinea pigs inoculated from squirrels very frequently present a pneumonia. The Oakland outbreak of thirteen pneumonic cases, which group, by the way, included two nurses and two doctors, was started by contact with squirrels, the first man having been squirrel hunting just before his onset. His case was primarily bubonic (axillary) with pneumonia supervening. The Los Angeles epidemic is not so easily traced to squirrels although in the rodent survey following, both rats and squirrels were found infected. There would seem, therefore, to be some ground for the theory that pneumonic plague is the result of a development of a specific organ virulence on the part of the prevailing strain of *B. pestis* by passage through a particular species of rodent. In this connection, Dr. Wu Lien Teh says: "The idea that the species of rodents involved in the epizootic might influence the character of subsequent epidemics is a very fascinating one. Especially it has to be considered if a close relation does exist between epizootics in certain wild rodents and human outbreaks of pneumonic plague. In fact, a worldwide study of the disease both in rodents and in man, as undertaken by our staff within recent years, has yielded many data supporting this view. On the other hand, in some countries where only ordinary rats are involved the incidence of lung pest is conspicuous also. But before reaching any final conclusions the following points should be considered: (1) Though ordinary rats are sometimes found to be the original source of pneumonic outbreaks, in many instances the local rodents were not involved, the disease having been imported from outside by human agency, namely, by travelers incubating the disease. (2) How long has the disease existed in the local rats? In some plague areas with rat epizootics, pneumonic plague was frequent soon after the introduction of infection, but became rarer afterward. One might consequently suggest that the longer

* Kellogg: Present Status of Plague, with Historical Review, *American Journal of Public Health*, November, 1920.

† Since this date, four cases of human plague have been discovered in California.

* Reports of North Manchurian Plague Prevention Service, 1927-1928.

the infection continues among ordinary rats the less chance there is for pneumonic plague to appear to man." Finally, the significance of ground-squirrel infection, leaving out of consideration any bearing it may have on the type of human plague, lies in the fact that a new endemic focus has been established and these endemic foci, constituted as they are by wild rodent infection, are so far as anyone knows at present permanent and everlasting.

The third query, "Is plague in California a menace to other states?" I would answer by saying "Yes" and for the following reasons: (a) Because of the possibility of direct extension of the disease in the wild rodent population across state lines. We have recently discovered plague among the ground squirrels of Modoc County, four hundred miles from the nearest previously known plague area and close to the State lines of both Oregon and Nevada. For all we know it has already crossed over into both states. (b) It may travel by transference to the rats in some border-line urban area, the rats traveling, as is their wont, in freight cars or ships to new and distant localities. (c) The last reason to be mentioned necessitates a return to the epidemiology of pneumonic plague. Teague and Barber,* as a result of their investigations in Manchuria, believe that the essential conditions for a rapid spread of pneumonic plague are a low temperature with considerable humidity, thus permitting droplets containing plague bacilli to remain suspended in the air a longer time and at the same time preserving them against the destructive influence of warmth and drying. They point out that the greatest pneumonic epidemic of modern times occurred in Manchuria in the winter of 1910-1911, when the temperature was many degrees below zero centigrade; also that in India only 2 to 5 per cent of the cases are pneumonic and no large pneumonic outbreaks have occurred there except one of 1,400 deaths in Kashmir at an elevation of about 5,000 feet and in very cold weather. If we accept the plausibility of Teague's and Barber's thesis, we must admit the possibility of some person during the incubation period of plague traveling East in the winter time. Should this traveler develop an axillary or cervical bubo with a secondary pneumonia, the stage will be set for a rapid man-to-man transfer of a form of the disease that has no rival in the rapidity of its spread and the certainty of a fatal outcome.

"GOVERNMENT WILL STEP IN IF CUSTOMERS ARE DUPED"

Drug Industry Must Govern Self as Buyer—Helpless to Judge Product

Government regulation of manufacturers to give the consumer a fair break is in the offing unless industry learns to govern itself, Graham A. Laing, Professor of Economics and Business Administration, California Institute of Technology, warned yesterday afternoon at the California Pharmaceutical Association convention at the Hotel Huntington.

Professor Laing touched upon the difficulty consumers in this complex age have in determining whether or not an article is adulterated, and cited the need for business to deal honestly with customers.

BUYER AT MERCY

"In the long run," said Professor Laing, "the modern consumer must rely upon the business conscience of the producer or—and this is of great importance—upon the organized government to see that the ignorance and helplessness of the consumer is not unduly preyed upon by unscrupulous manufacturers.

"In the Middle Ages the consumer was expected to be as familiar with the product and the materials of which an article was composed as the maker. This is no longer possible. Then adulteration methods were crude and comparatively easily detected. Hence the buyer was expected to be on his guard.

"At the present time even experience is of little help. The constant changes in materials, methods, and processes is so great that one can seldom rely upon continuity of quality. The result is that the consumer nowadays can no

longer depend upon his own examination, experience, and judgment. And, consequently, even the law has begun to catch up with the changed situation. The courts now consider such matters as implied warranties, and so give a certain protection to the innocent and ignorant consumer."

LEGISLATURE CRITICIZED

The so-called "horse and buggy" system under which the State Legislature functions was hit by Assemblyman James J. Boyle of Los Angeles, who criticized the election of attorneys to legislatures, expressing the opinion they tend to represent clients instead of the State.

The speaker scored the number of lobbyists and pressure groups, decrying the fact that 250 lobbyists can pull an assembly of eighty persons apart.

PRICE WAR WARNING

Charles Luckman of Chicago declared fair trade acts would not be needed if manufacturers want to cooperate with retailers in standard minimum prices. He urged delegates to cooperate with manufacturers that attempt to stabilize commodity prices, and asserted that if another price war is allowed to arise it will be more vicious than ever before witnessed.—*Pasadena Post*, June 23, 1937.

Diets of Industrial Families in North Atlantic Cities.—Economic pressure is one of the chief reasons for the small quantities of dairy products, vegetables, and fruits bought by the family of the average low-income city worker in the North Atlantic States, according to a study by the United States Bureau of Home Economics of food purchases and nutrition of 1,400 typical families in sixteen selected cities of New York State, Pennsylvania, Massachusetts, and New Hampshire. The study, based on family records kept during 1934-1936, gives information on the daily food choices and costs of these industrial families and compares their food habits with those of families spending comparable amounts for food in Southern and Pacific Coast cities.

North Atlantic families on the higher expenditure levels bought more foods rich in high-quality proteins, minerals, and vitamins, in proportion to their entire diet, than families spending comparatively little for food. Families averaging \$4 per capita a week bought five times as much citrus fruit, three times as much of other fruits and leafy, green and yellow vegetables, and between two and three times as much butter, eggs, meat, poultry, and fish as families averaging \$1.60 per capita a week. They bought only slightly more bread, flour, cereals, and fats other than butter.

High-grade diets, assuring good nutrition, were obtained by about 30 per cent of all the North Atlantic families. About one-half were on fair diets, and somewhat less than one-fifth on definitely poor diets. The food of three out of ten families spending less than \$2.50 per capita a week failed to meet minimum requirements for good nutrition in one or more respects, shortages of calcium and vitamins A and B being most frequently found. Less than 10 per cent of the families spending more than \$2.50 per capita a week were on definitely poor diets.

Each person in families spending about \$1.60 per capita per week got: 4 pints of fresh milk, about one-third of a pound of butter, 3 eggs, 1.5 pounds of meat, poultry or fish; less than one pound of sugar, 2.5 pounds of ready-baked bread, rolls, or other baked goods; .5 pound of cereal, one-half pound of flour and meal, 2.3 pounds of potatoes, one-fourth of a pound of dried legumes, 1.5 pounds of other vegetables, two-thirds of a pound of citrus fruit and tomatoes, and one pound of other fruits.

But in families spending \$4 per capita weekly each person got approximately 7 pints of fresh milk, three-fifths of a pound of butter, 8 eggs, 4 pounds of meat, poultry or fish, 1½ pounds of sugar, 3.5 pounds of bread, rolls and other baked goods, two-thirds of a pound of cereal, two-thirds of a pound of flour and meal, 3.5 pounds of potatoes, one-fourth of a pound of dried legumes, 4 pounds of other vegetables, 2.5 pounds of citrus fruits and tomatoes, and 3 pounds of other fruits.

Sixty per cent of the families in the first group, and only 4 per cent of those in the second, were on low-grade diets, probably inadequate to maintain average good health in the average person.

* *Philippine Journal of Science*, page 157, 1912.